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ABSTRACT

This project is designed to engage students in investigating specific environmental problems through concrete activities and direct experiences. In doing so, it fosters an awareness of the importance of informed concern about environmental issues. This resource is directed toward accomplishing the following goals: promoting students' understanding of the relationship between humankind and the environment; developing students' ability to identify and initiate action to solve problems; promoting an understanding of the complexity of issues, the difficulty of their resolution, and an awareness of different points of view; and developing students' process skills and knowledge of selected science topics. The materials are geared primarily toward students in grades 6 through 9 and include a variety of activities of different lengths and levels of difficulty, as well as extensions intended for older and younger students. This project consists of eight books: User's Guide, Planet, Air, Water, Land, Life, People, and Challenge and associated materials such as color transparencies, posters, and brochures. Each booklet is a self-contained unit. The units may be used as separate modules, or may be combined to form a course. The User's Guide includes: a list of enclosures, credits, origin of the project, contents and description, and a student assessment questionnaire. (JRH)

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USER'S GUIDE

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UNDERSTANDING OUR ENVIRONMENT

NSTA National Science Teachers Association

DUPONT

Books in this series:

USER'S GUIDE
PLANET
AIR
WATER
LAND
LIFE
PEOPLE
CHALLENGE

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User's Guide

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Credits	**3**
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Contents and Description	**5**
Student Assessment Questionnaire	**8**

This publication is dedicated to Dr. Alan L. McClelland for his many years of devoted work at DuPont, in the government, and in the community to develop and educate people of all ages in mathematics, engineering, and chemistry. His commitment to advancing the understanding of the sciences has influenced thousands of lives and careers around the world.

NSTA

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USER'S GUIDE : ENCLOSURES

The following items are contained in the envelope:

Posters

The Earth's Fractured Surface and *Living on the Edge,* National Geographic Society.

Bird Migration in the Americas, National Geographic Society.

Common Feeder Birds, Eastern Cornell Lab of Ornithology.

World Population Data Sheet, Population Reference Bureau.

The Water Cycle, Nature's Recycling System. U.S. Department of Agriculture, Natural Resources Conservation Service.

Satellite Imagery

North and South America, Photo Researchers.

North America, Photo Researchers.

The Living Earth, SPACESHOTS INC.

The U.S.A. at Night, Hansen Planetarium, Salt Lake City, Utah.

Transparencies

TOMS Imagery of the Antarctic Ozone Hole (10 images), National Aeronautics and Space Administration, TOMS Project.

TOMS Imagery of the Antarctic Ozone Hole (Two images), National Aeronautics and Space Administration, TOMS Project.

Weather Satellite Imagery, National Oceanic and Atmospheric Administration, Department of Commerce.

Forces at Work, plate tectonics. (Planet unit)

A Soil Profile. (Land unit)

A Soil Ecosystem. (Land unit)

The Water Cycle. (Water unit)

Postcard

Save Our Streams, Izaac Walton League.

Brochure

Have You Seen This Bird?, Cornell Lab of Ornithology.

Maps

Topographic Quadrangle, U.S. Geological Survey.

World Map for Planet unit.

1995 and 2030 World Population maps courtesy of Richard Furno, *The Washington Post.*

Metric Conversion Card

National Institutes of Standards and Technology, Metric Program.

Credits

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Origin of *Understanding Our Environment*

The idea for this project originated with the publication, *Understanding Our Environment,* Du Pont/Conoco, Birmingham, England, 1991, which has been translated into several European languages and inspired the present series.

This project differs from the United Kingdom publication in several major ways. However, portions of this project are based upon material from the United Kingdom publication. Substantial new material has been added.

The Challenge unit was adapted from the activity "The Clear Water Challenge" from the United Kingdom publication.

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Understanding Our Environment

This project is designed to engage students in investigating specific environmental problems through concrete activity and direct experience. In doing so, it fosters an awareness of the importance of informed concern about environmental issues.

In addition, this resource is directed toward accomplishing the following goals:

- Promoting students' understanding of the relationship between humankind and the environment
- Developing students' ability to identify problems and initiate action to solve them
- Promoting an understanding of the complexity of issues and the difficulty of their resolution, and an awareness of different points of view
- Developing students' process skills and knowledge of selected science topics

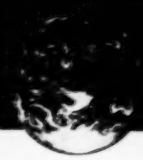
Target Grades

The materials are geared primarily toward students in grades 6 through 9, and can be used in grade 5 with sufficient modification. Parts of the material are also useful at the high school level. The units include a variety of activities of different lengths and levels of difficulty, as well as extensions intended for the younger and older students. In some units, suggested modifications are also mentioned in the Teacher's Notes.

Units and Associated Materials

This project consists of eight books (User's Guide, Planet, Air, Water, Land, Life, People, and Challenge) and associated materials such as color transparencies, posters, and brochures. (See list on page 2.) You may wish to laminate the posters and add holes for hanging reinforced with grommets.

Each book is a self-contained unit. The units may be used as modules, or all or several may be combined to form a course. Activities form the core of each unit, but relevant background information is provided for the teacher and, in some cases, the student. Many activities stress cooperative learning.



A Unifying Project for Each Unit

A distinctive feature of these units is the use of a unifying project in each, supported by a range of activities. Each project focuses on a particular environmental issue or problem and provides a vehicle for teaching specific science topics. The project, an extended activity, may begin or end the unit. Each project includes individual and group components. Another characteristic is consideration of local and global aspects of the issue or problem.

The remainder of the unit includes activities, demonstrations, discussions, and case studies. There are hands-on activities, field trips, journals, surveys, and research. (Field trips are optional, and alternative plans are included.) In most cases, the main activities are presented in a progressive sequence. However, it is not necessary to pursue all activities.

Depending on your objectives, time constraints, and students' needs, select which activities you plan to use. They vary greatly in time required, and some need advance planning. Units also generally include teaching strategies, suggested resources, and ideas for extensions, technological applications, and assessment. This information is presented in the Teacher's Notes throughout the unit. In addition, there are student Activity Sheets for many activities and occasional Information Sheets. These must be photocopied for the students.

Two units are exceptions. The Planet unit introduces the series; its project involves research on a wide range of issues. The Challenge unit is an extended role-play activity in which townspeople investigate the cause of a fish kill in a local river.

Overview of Content

The project, focus, and objectives of each unit are described in its Unit Summary, and the activities are described in the unit's table of contents.

Some recurring themes are: Earth's cycles and balances, the requirements of living things, the interdependence of species, and effects of human activities on the environment.

Planet	Project: Display on Earth in space and Earth's features Topics: Earth in Universe, Earth's interior, plate tectonics Issues: Issues about life on Earth
Air	Project: Monitoring acidity of rainwater samples Topics: Weather, the atmosphere, characteristics of air Issues: Acid rain, ozone depletion, and greenhouse warming
Water	Project: Study of a local waterway Topics: Water cycle, sources of fresh water, water quality Issues: Water pollution, preserving the environment
Land	Project: Investigating natural resources at a neighborhood site Topics: Earth's materials and their origins, rock cycle Issue: Effects of use of Earth's resources
Life	Project: Study local migratory birds and create wildlife habitat Topics: Bird habitats, ecosystems, carbon cycle, plants and animals Issue: Effects of human activities on ecosystems
People	Project: Design a future community Topics: Resources, development, technology, people's needs Issue: Effects of increased population on people and the environment
Challenge	Project: The Clean Water Challenge (a role-play activity) Topics: Causes of pollution, characteristics of debate Issues: Water pollution and cooperative problem solving

Curriculum Planning

In planning to use these units, involve the administration of the school in the activities and project, as well as to facilitate arrangements for field trips.

These units may be taught as a course or as modules.

1. A Separate Course. This series can be used to structure a science curriculum around environmental themes. Select a number of units for a year-long course. If you are using all of the units, present them in sequence. Choose which activities you are including, and plan ahead. Some projects and other activities may have to run concurrently. More than two semesters may be required.

2. Modules. Units may be taught individually, especially in conjunction with other disciplines. All are cross-curricular and interdisciplinary. For example, teach the People unit jointly with social studies. The Water unit and Challenge are complementary. In high school, each unit can serve as a cooperative project with social studies and language. Again, selection of activities may be necessary to meet the requirements of the course.

Understanding Our Environment

NAME: **UNIT:**

1. The most interesting activities and assignments I worked on in this unit:

2. The least interesting activities and assignments I worked on in this unit:

3. Skills I have used in doing this work:

4. Things I have learned that are important to me personally:

5. Things I would like to know more about:

6. People in the community who have taught me something:

7. Things I have observed about this unit's topic in our community:

8. Ideas for related community projects:

9. Ideas for related school projects:

10. Suggestions for who might be asked to help with these or similar projects:

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